DOCUMENT RESUME

ED 029 761 RE 001 767

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Pub Date Mar 69

Note-21p.: Paper presented at the 6th Annual Conference of the Association for Children with Learning Disabilities, Fort Worth, Tex., March 6-8, 1969

EDRS Price MF-$0.25 HC-$1.15

Descriptors-Auditory Discrimination, *Language Handicapped, *Learning Disabilities, Maturation, Perceptual Motor Learning, Pilot Projects, *Primary Grades, *Screening Tests, Visual Discrimination

The effects of maturational lag and innate perceptual-motor language learning disabilities on primary-grade children's school performance are discussed. Early identification of these learning disabilities is emphasized. A pilot study using 280 second- and third-grade children is described in which the feasibility of whole classroom screening to avoid identification delay was demonstrated. The Slingerland Screening Tests were used to identify visual, auditory, and kinesthetic problems and to indicate when there was a need for referral for extensive diagnosis. Further research now being conducted to test the feasibility and reliability of the Slingerland tests is cited. A bibliography is included. (RT)

ED029761

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Classroom Screening for Learning Disabilities in the Primary Grades: Utilization of the Slingerland Screening Tests for the Identification of Perceptual-Motor Deficits

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RE 001 797

The need.

After many years of neglect, the problem of school failure in language learning is receiving the attention it deserves. In August, 1968, the Secretary of the United States Department of Health, Education and Welfare established the National Advisory Committee on Dyslexia and Related Reading Disorders. (1) In the words of the Department, this committee "....was formed because of the need to coordinate the knowledge now available about the severely retarded reader and to advise on further research and services." (2) The Department is also currently supporting research in language disorders through offices within the Department. These include the Office of Education, Children's Bureau, National Institute of Neurological Diseases, National Institute of Child Health and Human Development, National Institute of Mental Health, and the National Center for Chronic Disease Control. Although there is continued effort to discover if there is one best way to teach children to read (3, 4, 5, 6) it is now evident that the focus is no longer on method alone. The child's inherent learning problems are to be identified and treated insofar as further research makes it possible to do so.

Nevertheless, while research is continued and expanded, our elementary schools still contain an estimated four million or more children seriously retarded in reading and other language

performance. Of this number some estimates, too well-known and numerous to cite here, place at least two and a half million in the category of specific dyslexics. Until research has found more answers, until enough money is available for special programs, and until enough specialists are trained, these children will remain in the elementary school classrooms where the burden of meeting their basic needs will continue to fall upon the primary grade teacher.

How well-prepared is the classroom teacher to meet these basic needs? The Harvard-Carnegie study has revealed the failure of teacher training institutions to familiarize their students with the problem of severe reading disabilities. (7) And how well these teachers can predict academic failure on the basis of only observation and judgment is open to question. Ilg and Ames conducted a study to determine correspondence between predictions based upon developmental examination response of children and teachers' ratings of those children. While they found agreement of 83% at kindergarten, they found only 68% at first grade and 59% at second grade. (8) Clearly then, grade teachers in thousands of classrooms need help so that children who are potential school failures or dropouts will be identified and helped before failure becomes reality.

Dr. Clifford H. Cole, chief of the Neurological and Sensory Disease Control Program of the U. S. Public Health Service, speaking at a New York symposium on dyslexia in 1967, stated, "It is vitally important that a test be developed to detect the disability early in a child's life." (9) Tests have in fact been developed but many of these require individual administration which is costly and time-consuming. Moreover, these tests are generally used only after a behavioral anomaly has been observed. Of other tests, developed for group screening, many are primarily applicable only to pre-school and kindergarten children.

But even if group screening in the kindergarten were to come into universal practice, almost half of our elementary school children would not benefit. As late as the last academic year, 1967-68, only 51.9% of the public school districts in the United states provided kindergartens and in only 26 states were they mandatory. For a large number of children, then, language learning deficits cannot be identified until after entrance into the primary grades.

However, it is in the primary grades that another gap exists at the present time. Most school policy dictates waiting until the end of the second or third grade before initiating remediation for failing children. This is justified by the hope that some of the early non-achievers will turn out to be

"late bloomers" who will catch up on their own. Eisenberg (10) condemns the view that we must be certain that a child is really in trouble and failing before he is entitled to help. "The child not beginning to read by the second semester of the first grade needs diagnostic study and the appropriate remedial education. If to achieve this means that we will be giving extra help to a child who does not need it for every child who does need it, then I urge that we do so. The surplus child will not be harmed and may be benefited; the dyslexic child will be reached at a time the chance of success is greatest. .....Where the healthy development of children is concerned, financial considerations are simply irrelevant."

If the lapse of two or three years between time of school entrance and remediation is to be overcome, school policy must change and primary grade teachers must be given the tools that will enable them to identify the deficits in children that lead to school failure. A basic tool is a group screening test that can yield information to be added to the teacher's own observation of behavior.

The Slingerland Screening Tests for Identifying Children with Specific Language Disability (11) is an example of such an instrument. These tests were developed for use beginning with the second semester of the first grade and continuing through the fourth grade. An experimental edition for kindergarten and earlier first grade use is now undergoing trial and validation.

Early identification of maturational lag and the perceptual-motor disabilities that may cause school failure should then result in appropriate educational intervention that will forestall such failure. (12, 13)

Maturational lag and specific language disability.

We now recognize that some children, who in all other respects compare favorably with their peers, are unable to respond well to conventional language arts instruction or to traditional remediation methods. Despite a general ability, they manifest a specific disability in one or more aspects of the written language.

An extensive literature, descriptive of specific language disability but using diverse terminology (14, 15) has developed in recent years. This reflects both the increased concern of educators and the multidisciplinary involvement of clinicians and research scientists during the past several decades. There is still a need, however, to explore more fully the relationship between maturational lag and specific language disability as manifested in the early school years. Monroe (16) pointed to the link between maturational lag and latent language disability, but although her work of the 1920's and 30's resulted in the wide-spread use of reading readiness tests (17) educators on the whole have not fully comprehended or followed through on the implications of her findings.

A maturational lag reflects a slowing down or an unevenness in the longitudinal developmental pattern that is recognizable in most children. (18, 19) There is little difficulty in discerning this when viewing early speech, rate of physical growth or gross motor activity but there is less recognition when the developmental delay or unevenness occurs in those perceptual-motor functions, visual, auditory and kinesthetic, that must subserve language learning in the school age child.

Orton (20) and Bender (21) have called attention to psychomotor lags in children. Money (22) has cited delayed maturation as a factor in some cases of language disability and especially in reading disability. Rabinovitch (23) believes that some 10 to 15 % of intelligent children cannot handle symbols of sight and sound successfully because of a disturbed pattern of neurological organization.

Rabinovitch's figure may, in fact, be an underestimation if we consider the impact of socio-economic deprivation and its accompanying hazards of malnutrition and inadequate prenatal and postnatal medical care. (24,25,26,27, 28) Recent studies have also raised questions about possible long-range effects of prematurity at birth. (29)

Screening for disabilities in the classroom.

Despite the mounting evidence that a significant percentage of the children who enter school each year come unprepared to cope with a traditional language arts curriculum, we continue to impose it upon all children. Since the average American child enters first grade at 5 years and 9 months, a tender age at which to experience frustration and failure, it is incumbent upon us to seek ways of identifying at the first possible moment those with special needs and then to provide for them. Special education has been an important part of our public school system since the 19th century. (30) It has served the "exceptional" child, the blind, the deaf, the mentally retarded and others. We need now to extend this concept to include specific language disability.

If special classes or programs are to be developed so that appropriate educational intervention will be the rule rather than the exception, then screening all primary grade children is the necessary first step. The instrument used should be economical of cost and time and designed for group administration. The classroom teacher should be able to view and interpret performance on the test within a context familiar to her and in relation to the school's curricular requirements. And, finally, the screening should reveal the level of perceptual-motor functioning as well as existing discrepancies between language learning modalities.

While acting as a consultant to schools and frequently in the course of talks to professional organizations or lectures at universities, this speaker was asked to recommend tests for screening and diagnostic purposes. This led to an intensified investigation of published instruments that resulted in an interest in the Slingerland Screening Tests (SST's) because these, more than others, seemed to meet desirable criteria.

Since the SST's are administered to an entire group within a classroom, performance is obtained under environmental conditions controlled for all the children screened at that time. Thus the teacher is able to observe deviations within a peer group that has in common an educational environment. And because the SST's use only phonemic-graphemic correspondences and number symbols, except for four geometric forms, the classroom teacher is able to view performance within a context familiar to her and relate it to her current language arts curriculum.

The subtests of the SST's give evidence of maturational lag or of deficits in the sensory-motor channels that subserve language learning. Because visual, auditory and kinesthetic modalities are involved in varied associations through the eight subtests, relative strengths and weaknesses of those modalities may be assessed. Though not a diagnostic instrument, the SST's do indicate when there is a need for referral for

diagnosis in children who give evidence of severe disability in the screening. Furthermore, in the absence of diagnostic facilities within the community, a regrettable reality for many, the teacher can use the SST's as a guide to more appropriate intervention in the classroom and effect a modification of method and material. Similarly, modification of method and material can be seen as desirable for children showing minor perceptual-motor deficits or developmental lag.

The pilot study

A study of the research up to 1967 indicated the need for more extensive work with the SST's for two purposes: one, to test the feasibility of whole grade screening through large group administration; and two, to test the reliability of the SST's as an instrument capable of identifying perceptual-motor deficits that might be predictive of underachievement or school failure due to language learning disability. A pilot study in October, 1967, was used for evaluation of planned methodology and for a preliminary test of feasibility and predictability.

Two elementary schools in a suburban community were selected for the pilot study. This community was chosen because of its very high socio-economic status so that generally unfavorable social, cultural, economic and educational factors

could be eliminated as contributing to school underachievement. Children who showed inadequate perceptuo-motor performance on the SST's would be presumed to be failing to achieve or underachieving; children who gave a good performance indicative of adequate perceptual-motor integration would be presumed to be achieving at the expected level for their general ability. The results of Metropolitan Achievement Tests and Otis Tests of Mental Ability would be used to check the reliability of the SST's as a predictive instrument.

Screening of 280 children, 145 in six second grades and 135 in five third grades, was completed in the first week of October, 1967. One school contained three second grade and three third grade classrooms; the other contained three second and two third grade classrooms. No special classes were in these two schools and the children were all in normal classes. Class size in second grade ranged from 20 to 27 with a median of 25; in the third grade the range was from 25 to 32 with a median of 25. Nine other children were absent from school and not tested.

All the children within a classroom were tested simultaneously in the three sittings required. No information about the children was gathered until after the tests were scored and performance evaluated. SST performance was ranked on a scale ranging from

very good to very poor. Those children who showed a significant number of errors (a negative score) were predicted to be failing in school or underachieving according to their general ability as measured by I. Q. tests. Predictions were later matched to achievement as shown on the Metropolitan and ability measured by the Otis or, in some cases, by a Stanford-Binet. Information was then obtained on family background, physical and emotional health and classroom behavior. Classroom teachers, principals and the guidance counselor cooperatively furnished this information.

Of the 145 second-graders, including those who had repeated the first grade or were repeating the second grade, 43 or 29.66% showed inadequate perceptual-motor performance on the SST's. Of the 135 third-graders, including repeaters, 44 or 32.59% showed significant error. The percentage for both grades combined was reduced to 26% when borderline performance, a negative score of 12 to 15 points, was placed in the doubtful or questionable category and eliminated from the deficit group.

When the SST's performance was matched to achievement and I. Q. test results, those children with significant negative scores were found to be achieving below grade and ability expectations or just at grade on national public school norms but below ability expectations. Noted, but not analyzed at this time, was a discrepancy between reading and arithmetic achievement for the children with perceptual-motor deficits.

Children with high ability achieved at grade or above on public school norms in some cases although they showed reading retardation of one to two years.

An extensive report of all the data cannot be included in this brief paper, but a few of the findings will be of interest. For example, School A contained two third grade classrooms with a total of 60 children who were screened. Of this number, 14 boys and 5 girls showed perceptual-motor difficulties on the SST's ranging from minor to severe. An analysis of age, ability and achievement of these 19 children revealed the following:

Age:	range	7yrs., 6 mos. to 9 yrs., 1 mo.
	median	8 yrs., 4 mos.
I. Q.:	range	96 to 133
	median	112

Achievement:

Reading

range	7 %ile to 90% ile (only 2 above 55%ile)
median	25%ile

Spelling

range	- 1 %ile to 70 %ile
median	23 %ile

Arithmetic

range	7 %ile to 91 %ile
median	45 %ile

In one of the second grades, considered a "normal" classroom but "slow" compared to the others in the school, it is interesting to note that of the 20 children in the class, 17 were identified by the SST's as having perceptual-motor deficits and that three of them were repeaters. These 17 also constituted the majority of the second graders within the school who gave a poor performance on the SST's. This group of 17 contained 12 boys and 5 girls and the later comparison of achievement and ability showed that they were falling significantly below general ability expectation in their school achievement.

Age:	range	6 yrs., 10 mos. to 8 yrs, 11 mos.
	median	7 yrs., 4 mos.
I. Q.:	range	98 to 150
	median	120

Achievement:

Reading		
	range	2 %ile to 75 %ile
	median	15 %ile
Arithmetic		
	range	2 %ile to 95 %ile
	median	45 %ile
Spelling	not included in battery	

The pilot study demonstrated the feasibility of whole classroom screening and indicated reliability of the SST's as a screening instrument for identifying perceptual-motor deficits...The SST's were deemed appropriate for the prediction of language learning difficulty or disability and thus academic failure or underachievement. These conclusions, however, were considered valid only for the favored environment provided for the pilot study. The questions of feasibility and reliability under widely disparate environmental conditions remained.

Current research with the SST's.

A further effort is now underway to test the validity of the SST's in school systems that serve vastly varied population groups. With the cooperation of the school system of an industrial city, 3000 children were screened with the SST's in February of this year. Because of the goal in screening, early identification followed by appropriate educational intervention, testing was limited to the first and second grades. Every public school child in the city in these two grades participated.

The city, with a school population of 18,000, has 21 elementary schools. Nine of these schools have qualified for federal aid because their populations meet low income, ADC and other poverty criteria. Urban renewal is rapidly changing

the type of enrollment in some of the schools, however, and it is anticipated that other schools may qualify for federal aid in the future. Because of the residential pattern in the city, other schools have populations similar to suburbs of high socio-economic status.Thus we have the opportunity of comparing performance on the SST's in schools with a known disadvantaged population with performance of an advantaged population within the same school system. At the present time, the city has no public kindergartens but a survey has shown that in the schools with a highly advantaged population, most of the children have attended private preschools. We will attempt to evaluate the effects of preschool attendance on SST performance.

The SST performances are now being scored and evaluated. In May, Metropolitan Achievement Tests will be given and the SST predictions will be matched to those results and to Kuhlmann-Anderson I. Q. tests. Data relating to family background, physical and emotional health, socio-economic status of individuals and of their schools, and teacher observation is now being collected. School achievement will be followed through the sixth grade. Test and retest studies will be done, and about 500 children will furnish data on the Wechsler Intelligence Scale for Children that will be correlated with the SST findings.

Summary

Research indicates that both maturational lag and innate language learning disabilities of a perceptual-motor nature result in school failure or underachievement in a large number of children. Appropriate educational intervention in the early school years can circumvent learning disabilities but such intervention is dependent upon prompt identification of the problems. The prevailing practice of a two or three year delay can be overcome most economically by wide-scale group screening. The Slingerland Screening Tests for Identifying Children with Specific Language Disability may be a useful tool. Current research is underway to establish the degree of feasibility and reliability of its use.

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